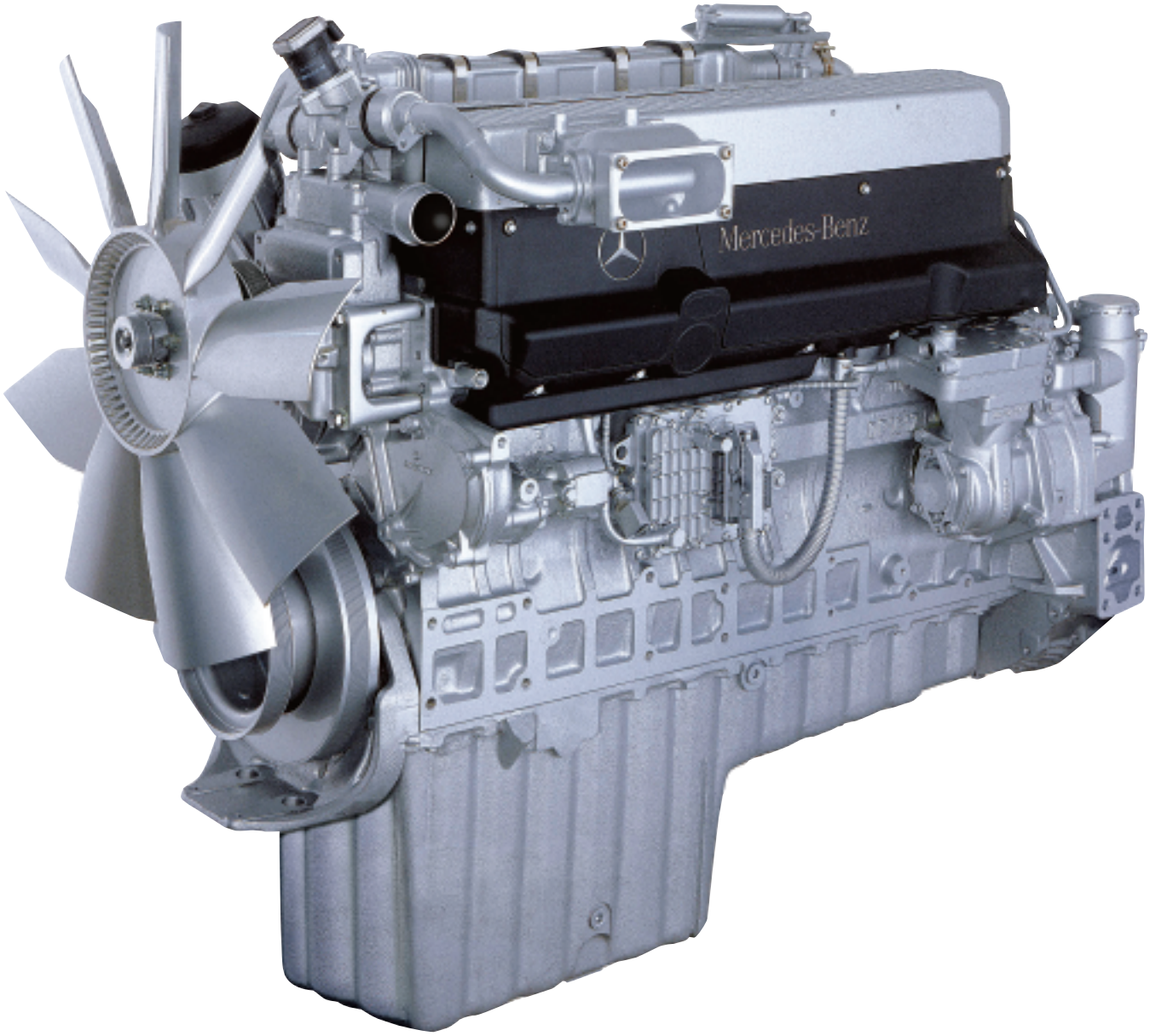
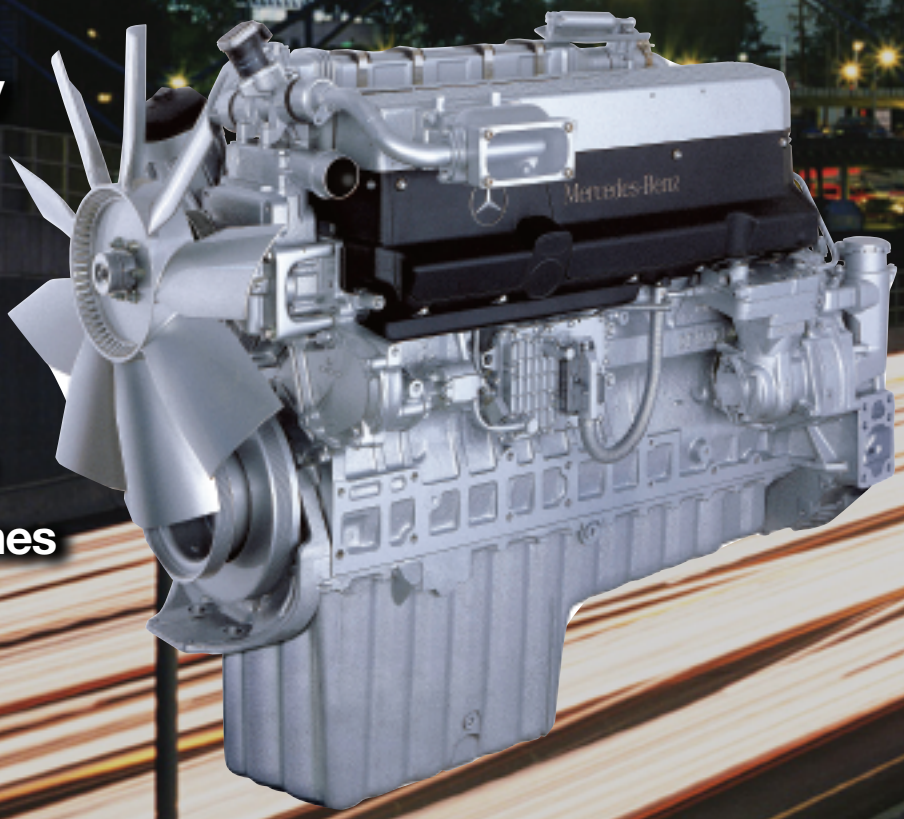
Mercedes-Benz

MBE4000



For On-Highway
And Vocational Applications

The MBE 4000 Increases Productivity And Reduces Operating Costs



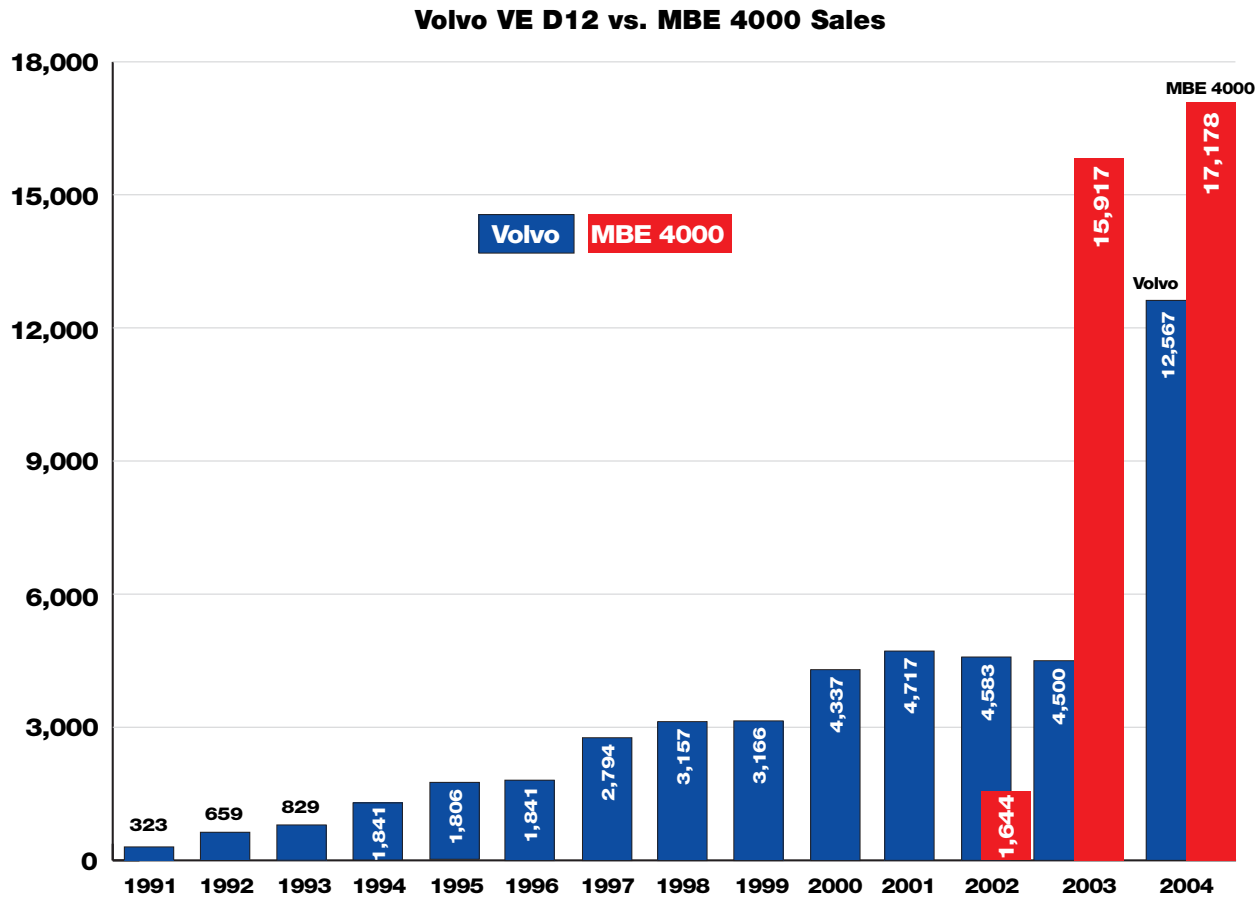
Manufactured Specifically For The Demanding North American Market By Mercedes-Benz. Mercedes-Benz And DaimlerChrysler Produce Over 500,000 Diesel Engines Per Year. The MBE 4000 Is Stronger And Lighter Than Any Engine In Its Class.

Over 200,000 Engines In The MBE 4000 Family Are In Service Around The World

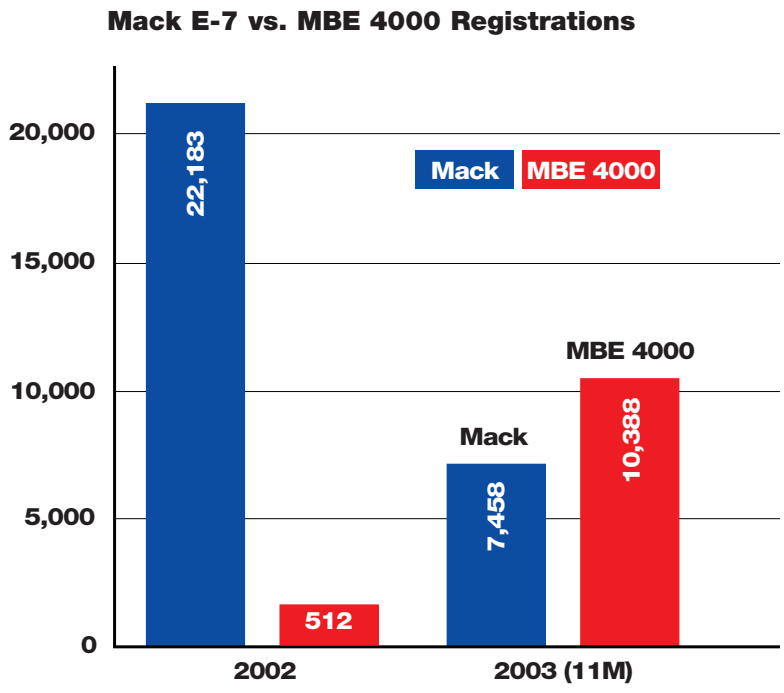
The MBE 4000 Manufacturing Facility

What Type Of Customers Specify MBE 4000's?

The Rapid Acceptance Of The MBE 4000

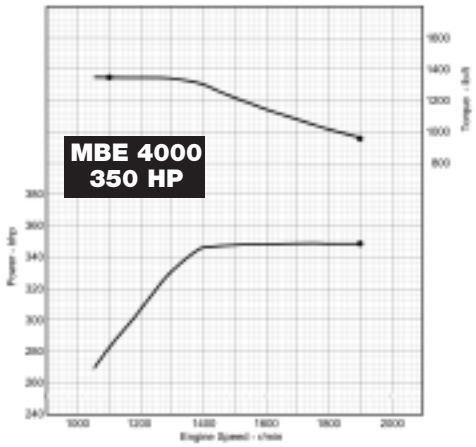


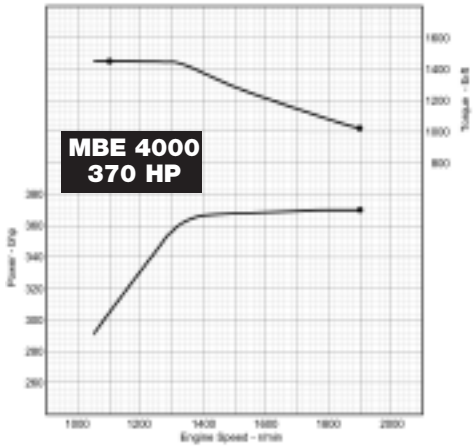
In Only 4 Years, The MBE 4000 Has Rapidly Been Accepted In The U.S. Truck Market. By Comparison The Volvo VE D12 Was Introduced Into NAFTA In 1991. The MBE 4000, Introduced Into NAFTA In Late 2001, Has Shown Strong Acceptance In All Applications, Both On-Highway And Vocational.

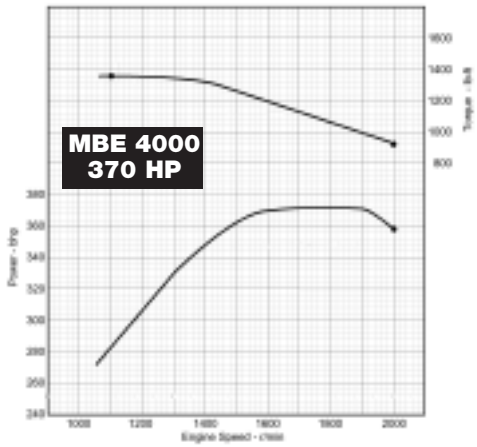


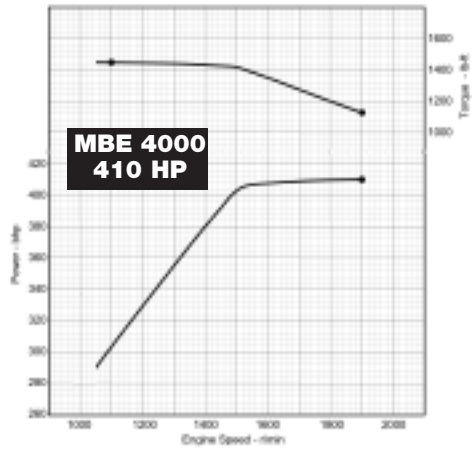
Why Has The MBE 4000 Shown S

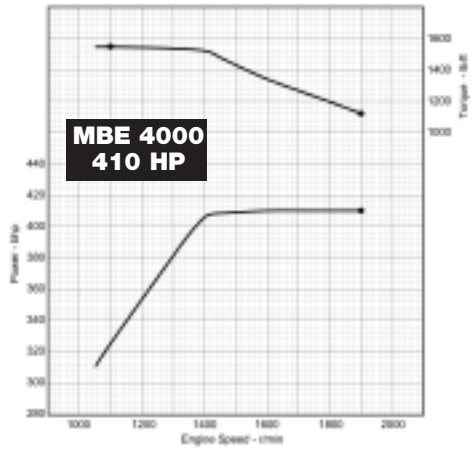
It All Begins With Power. With 12.8 Liters Of Displacement, The MBE 4000 Offers Impressive Levels Of Power At All Ratings.

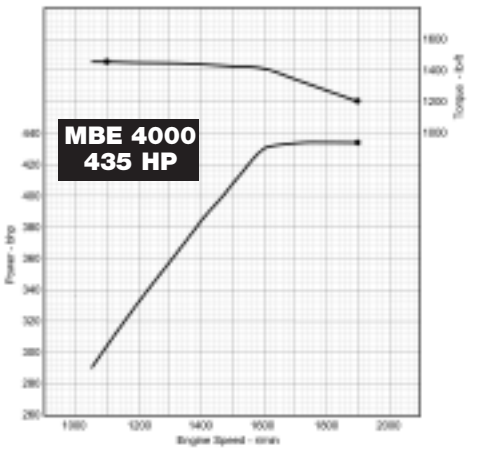






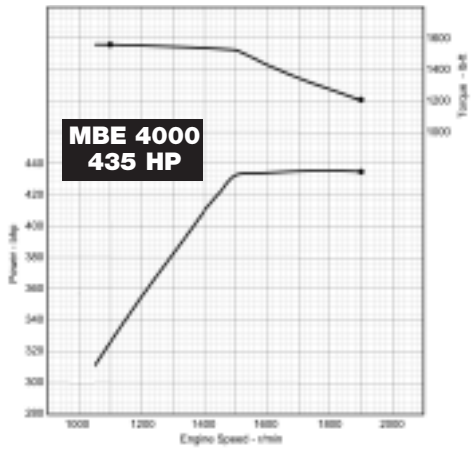


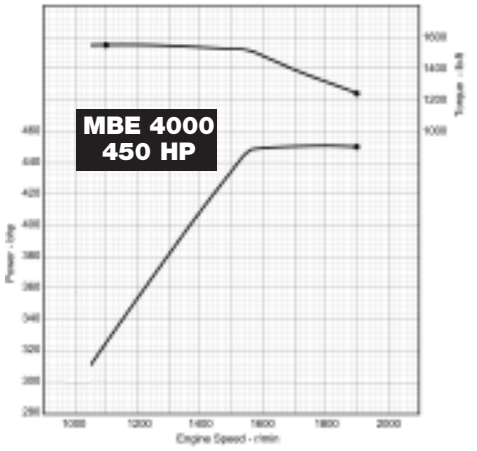




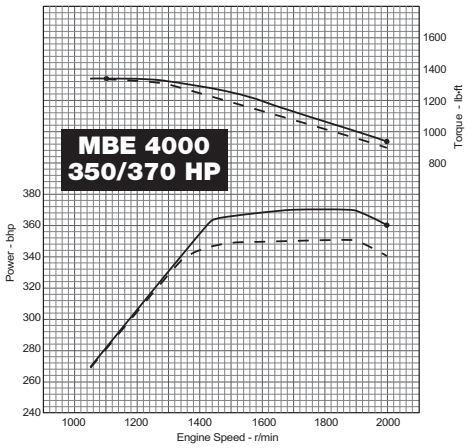
Note The High Level Of Available Torque Even At 1000 RPM.

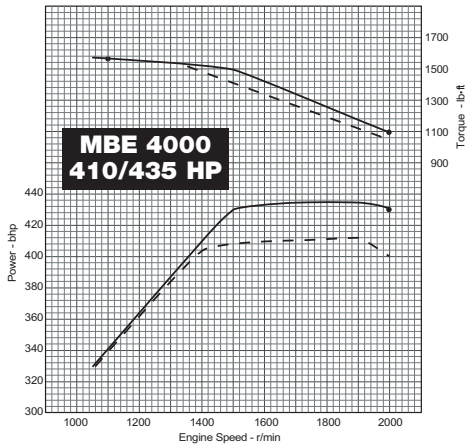
High Torque At Low RPM Is Essential For Good Vehicle Performance, Particularly In Demanding Vocational Applications.

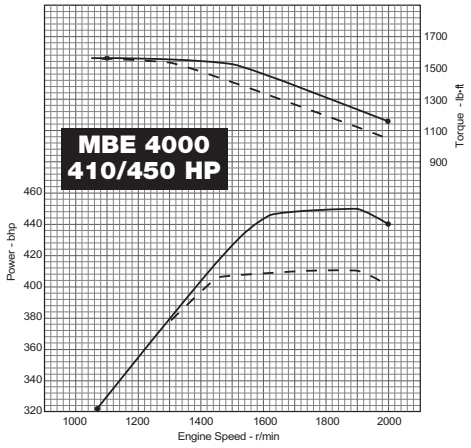




uch Rapid Acceptance?





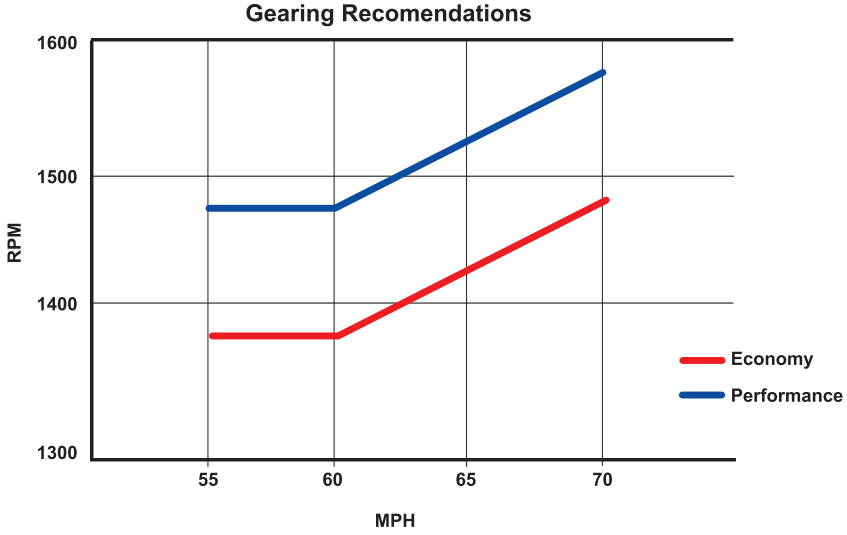


Number Of Cylinders	6/in-line
Bore	5.04 in. (128mm)
Stroke	6.54 in. (166mm)
Displacement	781.12 cu. in. (12.8 liters)
Weight, Dry, With Std. Equipment	2,117 lbs. (961 kg) (includes engine brake)
Air System	Turbocharged with Air-to-Air Charge Cooling
Control System	Advanced Electronic
Compression Ratio	17.75:1
Length	53.1 in. (1350mm)
Width	42.1 in (1070mm)
Height	44.5 in. (1130 mm)

Horsepower and Torque Summary

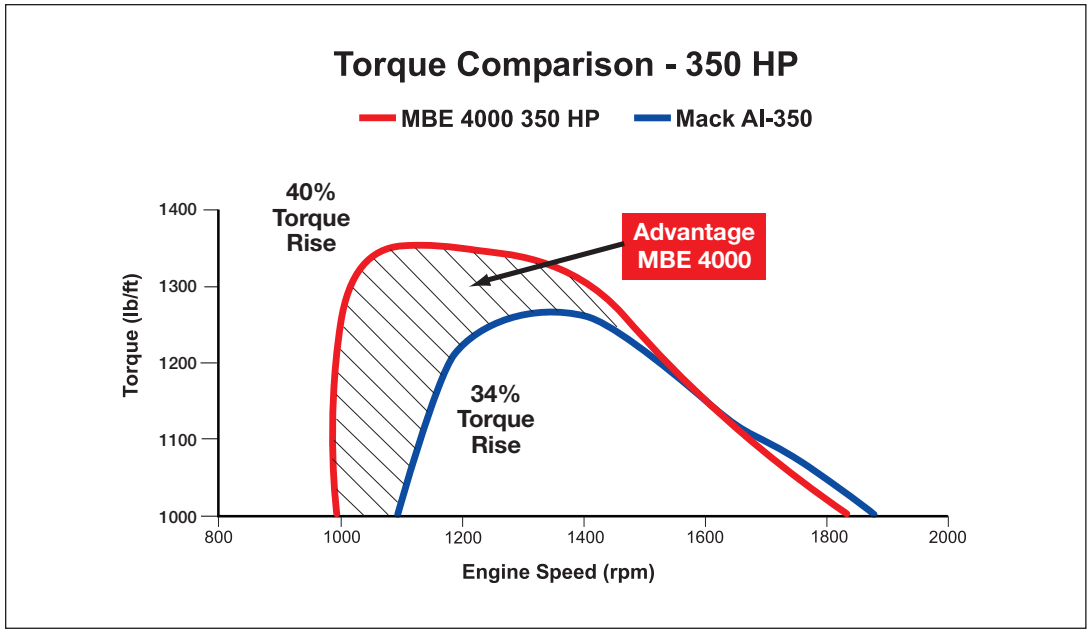
Engine	Horsepower	Torque
MBE 4000-350	350 HP @ 1900 RPM	1350 lb-ft @ 1100 RPM
MBE 4000-370	370 HP @ 1900 RPM	1350 lb-ft @ 1100 RPM
MBE 4000-370	370 HP @ 1900 RPM	1450 lb-ft @ 1100 RPM
MBE 4000-410	410 HP @ 1900 RPM	1450 lb-ft @ 1100 RPM
MBE 4000-410	410 HP @ 1900 RPM	1550 lb-ft @ 1100 RPM
MBE 4000-435	435 HP @ 1900 RPM	1450 lb-ft @ 1100 RPM
MBE 4000-435	435 HP @ 1900 RPM	1550 lb-ft @ 1100 RPM
MBE 4000-450	450 HP @ 1900 RPM	1550 lb-ft @ 1100 RPM
MBE 4000-350/370	350/370 HP @ 1900 RPM	1350 lb-ft @ 1100 RPM
MBE 4000-410/435	410/435 HP @ 1900 RPM	1550 lb-ft @ 1100 RPM
MBE 4000-410/450	410/450 HP @ 1900 RPM	1550 lb-ft @ 1100 RPM

Here's How To Gear Your MBE 4000 For Maximum Performance And Fuel Economy



How Does The MBE 4000 Stack U

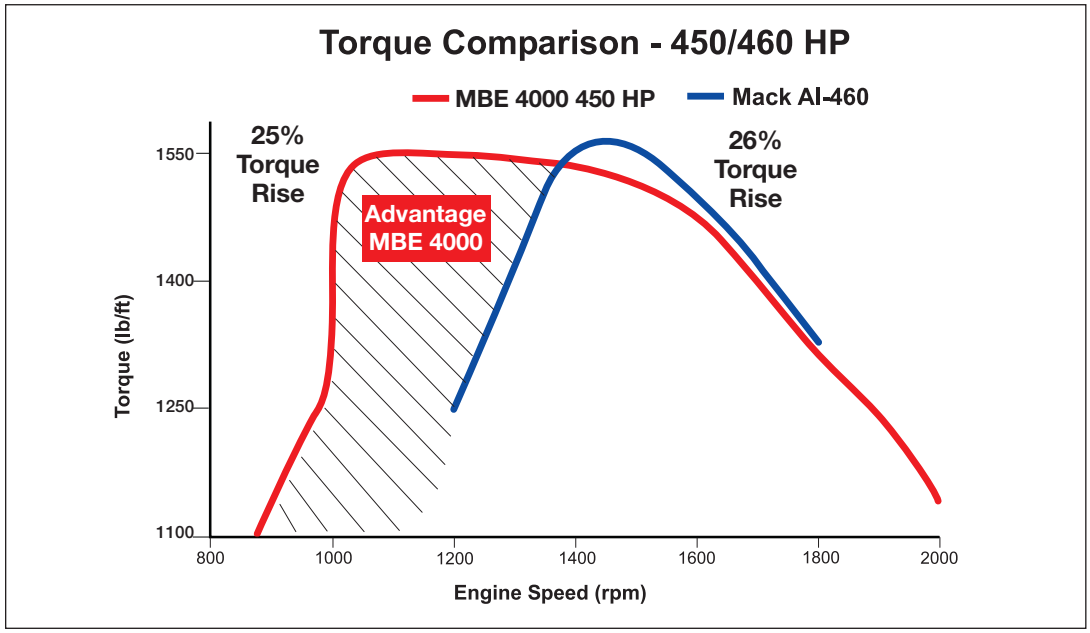
High Torque At Low RPM Is Critical For Vocational Applications. The Following Charts Compare The MBE 4000 To The Mack AI-350 And AI-460 Models.



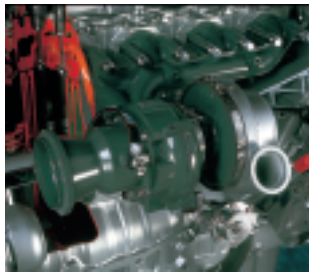
"Torque Rise" Is Usually Expressed As The Percentage Of Torque Increase (Rise) From Rated RPM To The Torque Peak. High Torque Rise In Combination With The Torque Peak At Low Engine RPM Is Desirable In Order To Have "Torque In Reserve" When Rough Terrain Or Steep Grades Have To Be Negotiated.

p Against The Competition?

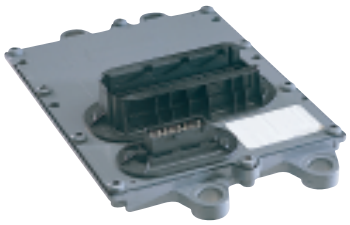
Note The Torque Rise Advantage Of The MBE 4000 vs. The Mack AI-350, And The Significant Additional Torque Available From The MBE 4000 At Low RPM, Just Where It Is Needed For Good Vehicle Performance.



And, MBE 4000 Is The Fuel Economy Leader



Get up and go: The MBE 4000's high output turbocharger combined with the effective combustion fine tuning virtually eliminates throttle lag, and gets heavy loads moving quickly



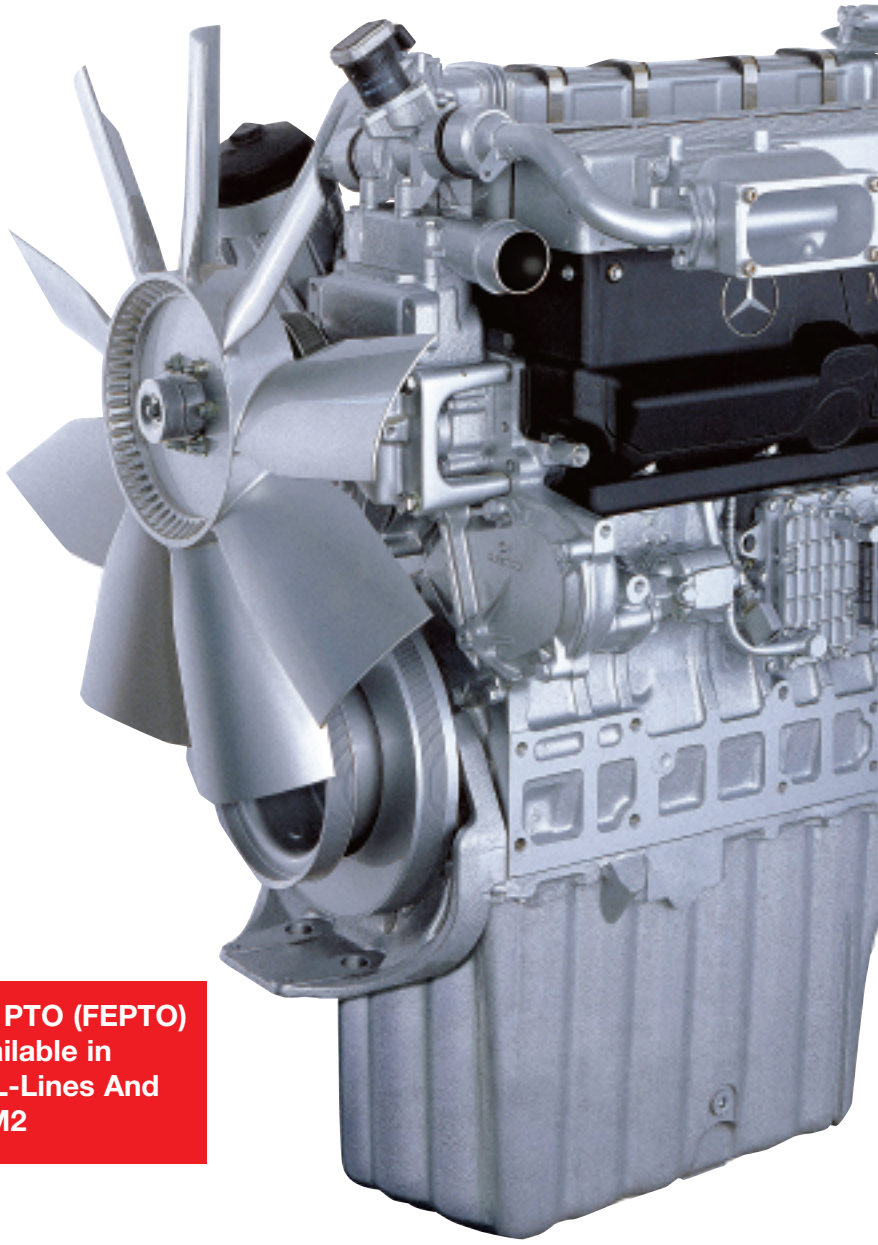
Electronic engine control ensures perfect engine management under all driving conditions and provides for individual adjustments to maintain performance over time

Electrically controlled injectors feature a unit pump injection system with injection pressure up to 29,000 psi, creating clean combustion and precise fuel supply

Lots Of Power, In A Light Weight

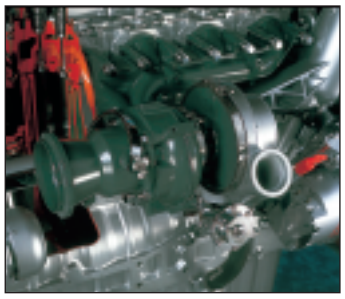
Performance Features

- The MBE 4000 comes standard with the MBE compression brake and exhaust brake combination, for improved vehicle control and maximum service brake life. When combined with the optional turbo brake, the MBE 4000 provides the most braking horsepower in its class.
- High torque at low RPM means excellent acceleration and outstanding gradeability, all with reduced shifting.
- The high-output turbocharger is perfectly matched with high-pressure injectors for excellent driveability, outstanding fuel economy, and low emissions without the need for aftertreatment devices.
- Electronic Engine Management System (EMS) "thinks" like a fleet manager, ensuring peak engine efficiency.
- The MBE 4000 engine meets EPA and CARB emission regulations without aftertreatment.
- Electronic engine control ensures perfect engine management under all driving conditions and provides for individual adjustments to maintain performance over time.

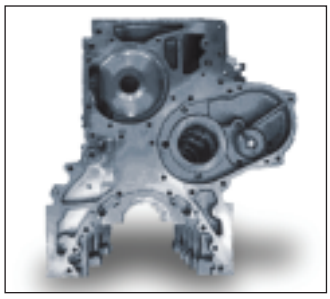


Front Engine PTO (FEPTO) Option Is Available in Sterling A & L-Lines And Freightliner M2

Lightweight: *For increased payloads in weight sensitive applications*

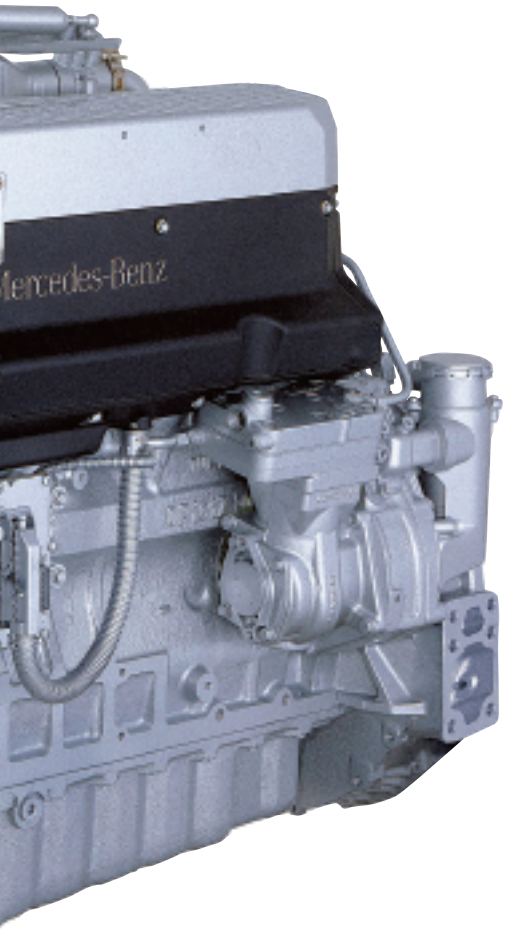


Get up and go: *The MBE 4000's high output turbocharger virtually eliminates throttle lag, and gets heavy loads moving quickly*



Strong, light and durable: *A cast iron block is design-optimized, contributing to the MBE 4000's industry-leading power-to-weight ratio—and impressive fuel economy*

Package, And All This Too...



Reliability And Durability

- Ceramic-coated piston rings, gear-driven oil pump, plateau honed cylinder liners with fire ring, oil-cooled pistons, heat-treated crankshaft and patented Top-Liner Cooling for long life and reliable operation.

Driver Satisfaction

- Maximum torque is available at just 1,100 RPM for fewer shifts, less clutch wear, quieter operation, fast acceleration, and reduced driver fatigue.
- Cruise control provides driving ease, and a dual road speed limiter optimizes driver control for safe use of the vehicle and reduced fuel consumption.

Support When And Where You Need It By Detroit Diesel

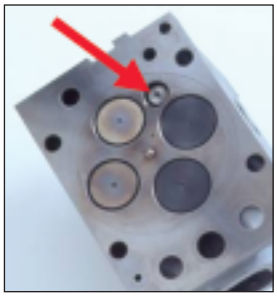
- 176 Detroit Diesel Distributor locations across North America and over 600 Freightliner, Sterling and Western Star dealers, all with factory-certified technicians who know your MBE 4000 inside and out.
- NAFTA-wide parts availability at all Detroit Diesel Distributor locations and Freightliner, Sterling and Western Star dealers.
- Immediate roadside assistance and technical support are just a telephone call away, 24/7.
  1 800 445 1980
- Full 2-year, unlimited mileage warranty for truck applications.

Great Fuel Economy And Low Operating Costs

- Air-to-Air charge cooling, six electronically controlled high pressure injector pumps and a matched turbocharger contribute to optimize combustion for high fuel efficiency.
- Class-leading power-to-weight ratio means more payload.
- Large capacity oil pan for extended oil drain intervals.
- Extended routine maintenance schedule minimizes service costs.
- Electronic data logging to monitor fuel consumption and reduce operating costs.

"The MBE 4000s rated at 350 hp and 370 hp are performing well and drivers like them because of their great acceleration"

Regional Distribution, VP of Facilities and Equipment



Braking power to spare: *An innovative, compression brake that provides high braking horsepower comes standard on all engines and adds no weight to your vehicle*

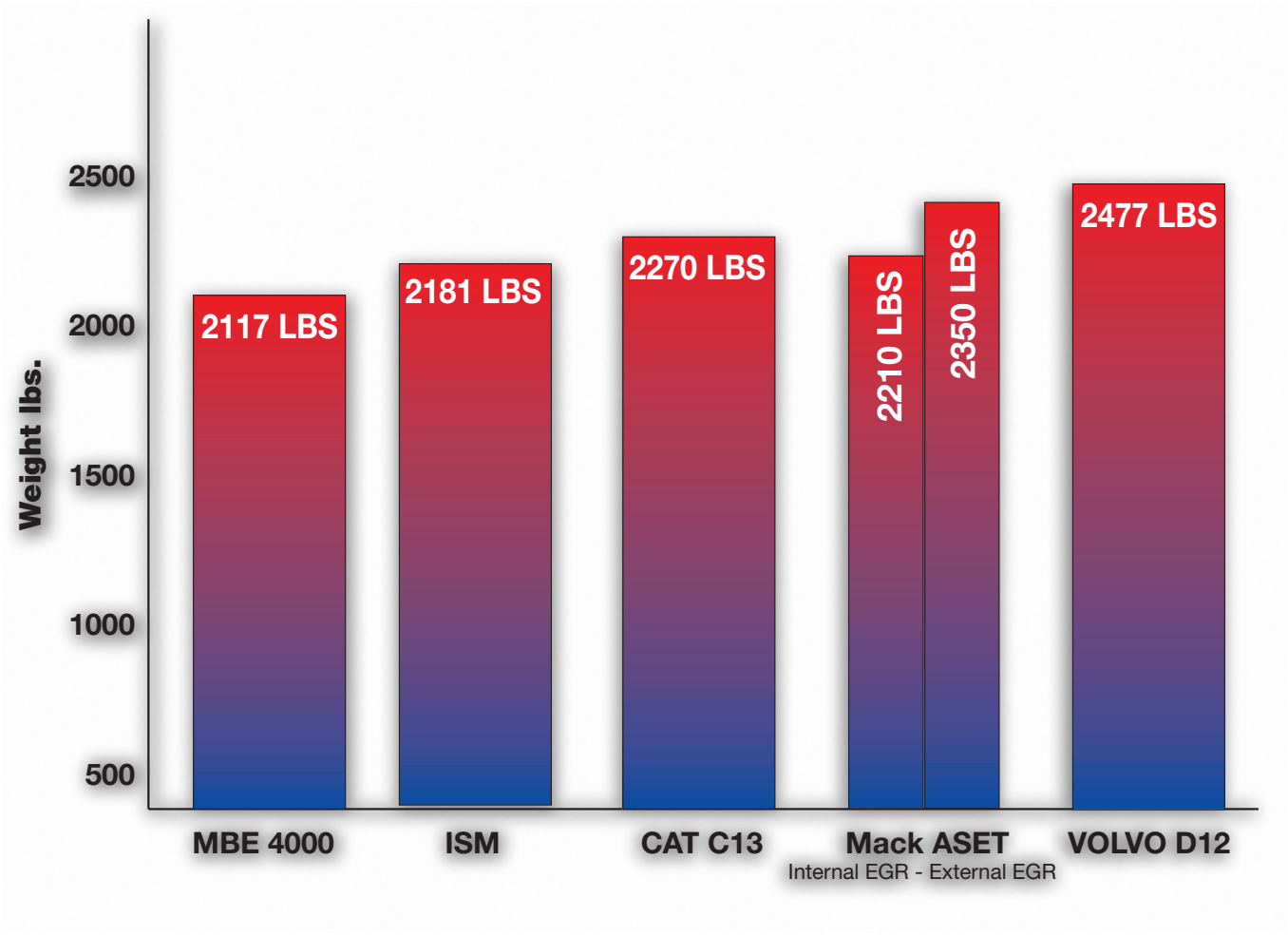
Miles to go: *Components like heavy-duty connecting rods and pistons mean long life to overhaul*

Easy access: *Oil filter is positioned upright near the front of the engine and fuel filter is positioned upright on the right hand engine side for easy service and maintenance*

Electrically controlled injectors *feature a unit pump injection system with injection pressure up to 29,000 psi, creating clean combustion and precise fuel supply*

How Important Is WEIGHT?

Why Leave An Extra 200...300 Lbs. Of Payload On The Dock...Every Day!



And, The Weight Of The MBE 4000 Includes The Standard Engine Brake With 368 Braking Horsepower @ 2300 RPM.

And There Is More...
The MBE 4000 Is Equipped With DDEC!

The MBE 4000 takes electronic engine management to a whole new level with a sophisticated control system that provides the ability to customize the engine to your application for peak efficiency.

The MBE 4000 electronic control optimizes fuel injection in real time to maximize fuel economy, performance and emissions. It diagnoses your MBE 4000 on the fly, using onboard diagnostics. It even protects the engine from damage by directing system shutdowns to prevent catastrophic failures.

- **Sensors** signal operations outside of preset engine parameters
- **Auto shutdown** will prevent engine damage
- **Multiple performance and fuel economy reports** are available
- **Built-in electronic redundancies** for superior reliability

Fully electronic, fully automatic and fully reliable, with fewer moving parts than less sophisticated engine management systems

- **Self-diagnosing and self-protecting** to eliminate guesswork and accidental damage
- **Modular components** can be replaced easily and inexpensively
- **Data collection/sharing enabled** for fleet management
- **Remote throttle PTO option**

Driver Satisfaction

- Cruise control provides driving ease, and a dual road speed limiter optimizes driver control for safe use of the vehicle and reduced fuel consumption.

New MBE 4000 DDEC Features

Smart Cruise

An adaptive cruise control feature that works in collaboration with Eaton VORAD™.

PasSmart

The PasSmart feature allows a fleet manager to enable a second Vehicle Limit Speed (VLS) above the normal VLS to assist while passing other vehicles on the highway.

Fuel Economy Incentive

Fuel Economy Incentive is a standard DDEC feature for on-highway Detroit Diesel engines. The purpose of this feature is to allow the fleet manager to set a target fuel economy while providing the driver an incentive to meet the target.

Using the Fuel Economy Incentive option, a fleet manager can set a target fuel economy for each engine. If this fuel economy is exceeded, the driver will be given a slightly increased vehicle speed limit.

Cruise Power

Cruise Power is an optional engine rating which operates on a higher horsepower during Cruise Control. The ECU automatically switches to the cruise power rating when Cruise Control is turned on. This extra power gives the driver incentive to run in Cruise Control whenever possible and gain the additional fuel economy it provides.

Password Protection

MBE electronics provide various levels of password protection such as Rating Password, Injector Password, and Customer Password. Parameter Group Lockout is needed for another level of password protection that affects groups of functions.

Vehicle Speed Sensor Anti-Tamper

VSS Anti-tampering can be used to detect fixed frequency oscillators or devices which track engine RPM and produce fewer pulses per revolution than a VSS wheel. These devices are used to trick the ECU into believing that vehicle speed is low.

This feature should only be enabled on installations with manual transmissions where a Vehicle Speed Sensor is wired directly to MBE electronics.

Idle Shutdown Anti-Tamper

Idle Shutdown Anti-Tamper is a feature which prevents drivers from tampering with the idle shutdown pre-set parameters to maintain fuel efficiency.

Engine Fan Braking

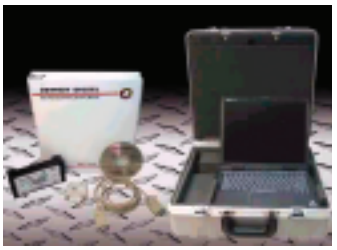
The Engine Fan Braking option turns on the cooling fan when the engine brake level is high and MBE electronics fan control is enabled. This creates about 20 to 40 hp additional engine braking power depending on the size of the cooling fan.

MBE 4000 Troubleshooting Information Management Tools...

- **ProDriver® DC**

- **Detroit Diesel Diagnostic Link**

- **ProLink® Reader**



Reprogramming Capability Has Now Been Brought To The Local Distributor / Dealer Level

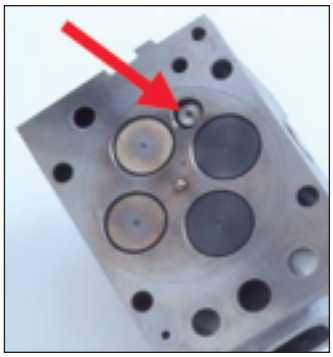
The MBE 4000 Offers 2 Engine Brakes, One Standard, And An Additional Optional Extremely Powerful Turbobrake

- ***Standard Brake –*** **Combination Of Both – A Compression Brake And An Exhaust Brake**
- ***Optional Turbobrake***

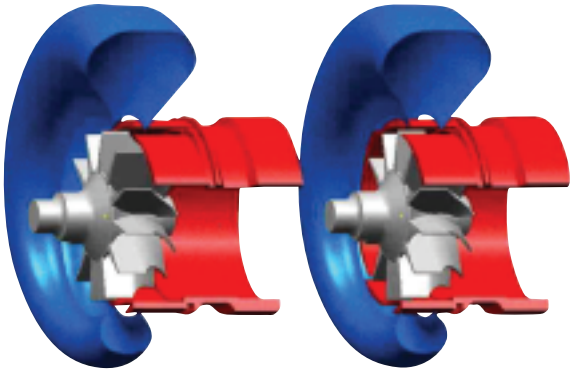
Standard equipment on an MBE4000 engine includes both a compression brake and an exhaust flap brake at no additional cost or weight.

Turbobrake – An Exclusive Option On The MBE4000

For maximum effectiveness, the turbobrake provides the ultimate in stopping power – over 500 braking horsepower. 50 horsepower higher than the maximum rated engine horsepower.



Braking power to spare: *An innovative compression brake that provides high braking horsepower comes standard on all engines and adds no weight to your vehicle*



Lightweight, Compact, High Performance Turbobrake Option That Doesn't Have The Complexity, Cost, Heat or Weight of a Hydraulic Retarder

How Does The Turbobrake Work?

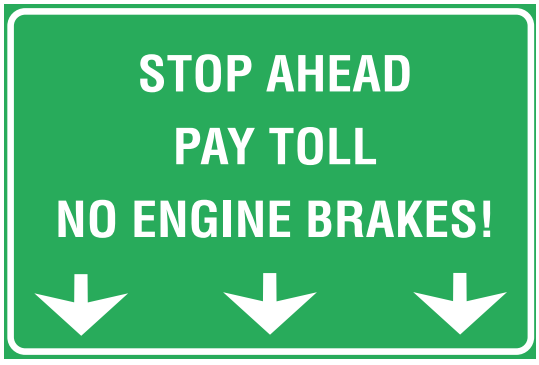
When The Engine Goes Into The Braking Condition, The Blade Ring Automatically Slides Forward And Redirects The Airflow Against The Turbine Blade To Accelerate The Turbine Wheel, Increasing The Air Mass Flow.

The Detroit Diesel standard engine brake (high/low driver selection) produces:

- **368 braking horsepower @ 2300 RPM on the MBE4000**

The Detroit Diesel optional turbobrake (low/medium & high driver selection) produces:

- **538 braking horsepower @ 2300 RPM on the MBE4000**



Both The Standard And Optional Brakes Operate At Noise Levels Significantly Below That Of Typical Engine Brakes And Can Often Be Used Where Others Are Prohibited.

How About Durability?

The MBE 4000 Stands Up To The Challenges Of:

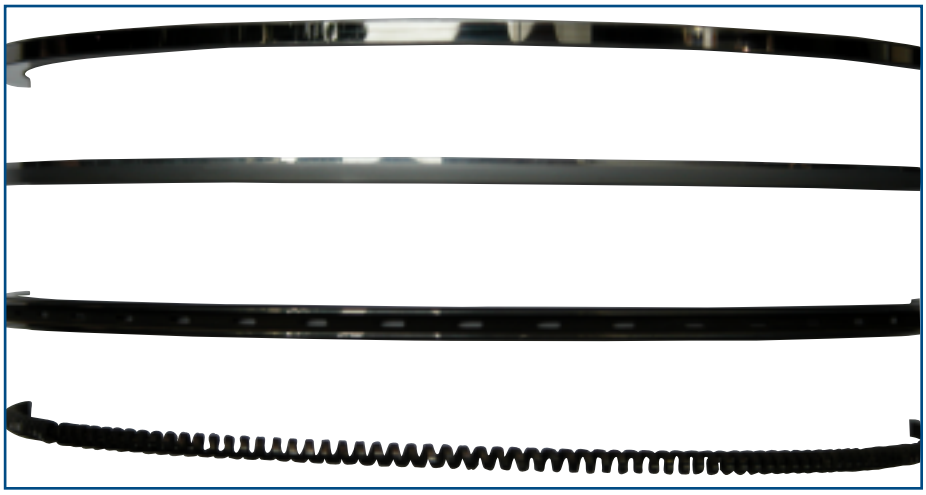
- **Drivers**
- **Miles**
- **Loads**

See For Yourself.

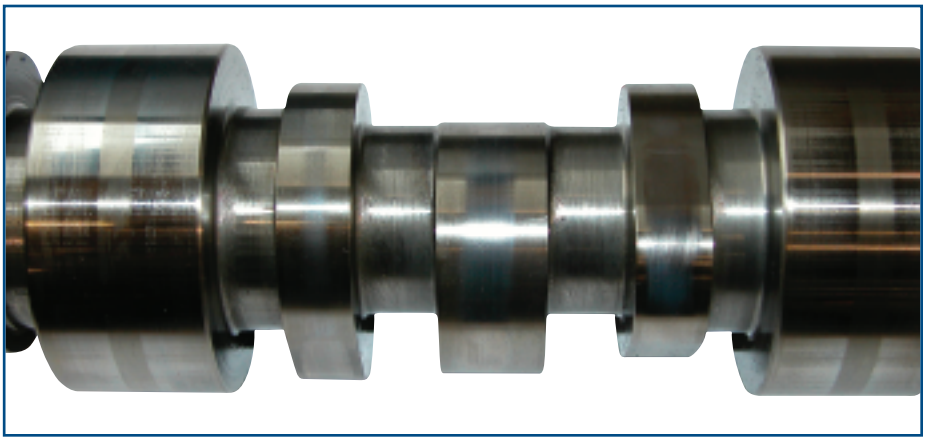
The MBE 4000 proved itself from the inside out. And, now we are adding EGR and maintaining the original foot print. We are modifying the engine, not reinventing it.

An engine was inspected at 650,000 miles of long haul operation, and all components were in perfect condition compared to the accumulated mileage.

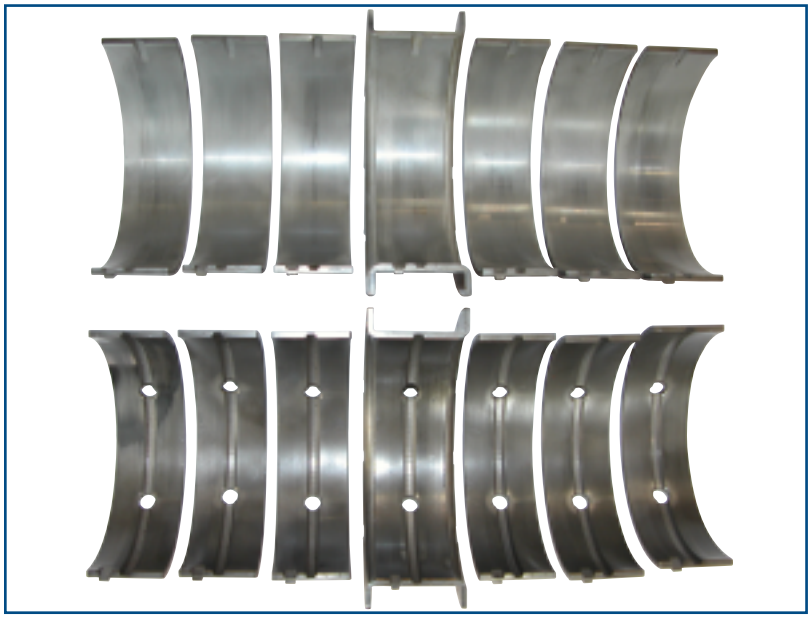
The piston appearance is very uniform. The piston bowl is clean, the top land is free of hard carbon deposits (which guarantees a long life of the liners cross hatch). Piston pin bushing and piston pin show a uniform pressure distribution without any local scores or damages.

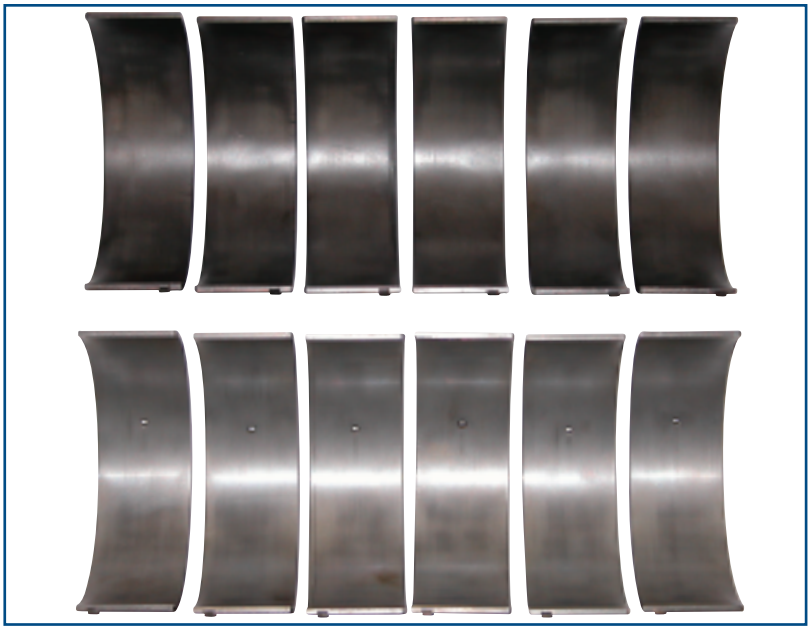


All piston rings show a very low wear level free of scores or unusual local wear. The ring on the top, which is the fire ring, has a tapered face and it is easy to see how much ring life remains.



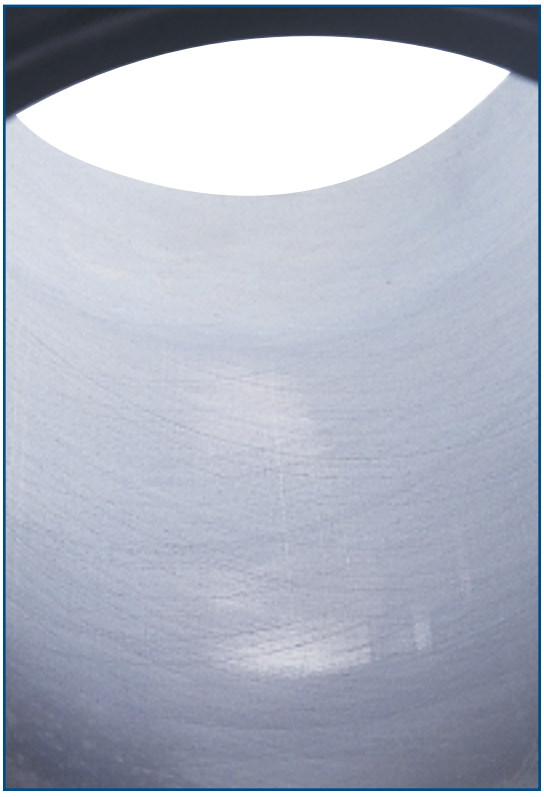
All the lobes of the camshaft are without any visible wear or pitting.





The main bearings as well as the conrod bearings show very uniform, unvisible wear. A sufficient wear reserve is still remaining. No local pressure marks, or

Piston pin: uniform pressure distribution over the whole length without local pressure marks.

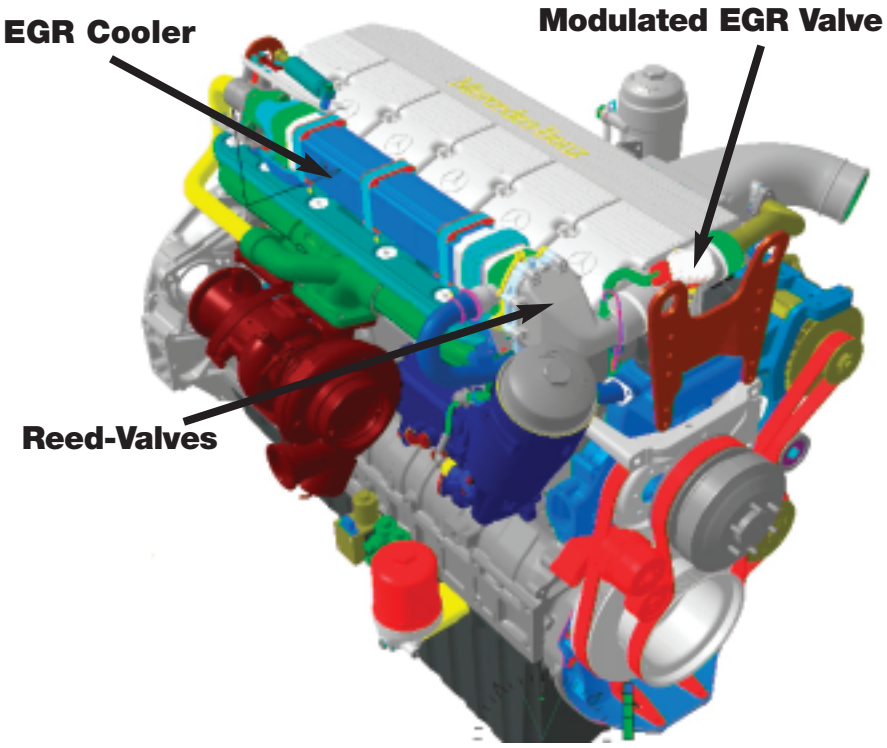


All the liners still show the original cross hatch and exhibited almost no wear at all. There are neither signs of bore polishing, nor wear marks at the reversal points of the piston rings.

Emission Compliant With Exhaust Gas Recirculation (EGR)

How Does EGR Work?

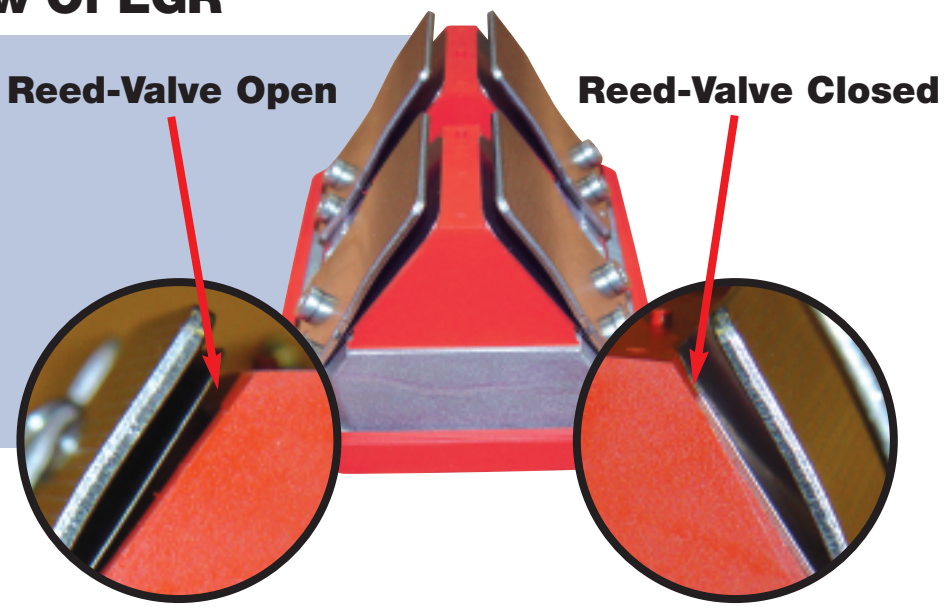
During certain conditions of engine operation, measured amounts of cooled exhaust gas are routed to the intake manifold. The cooled exhaust gas mixes with the incoming fresh air and displaces some of the oxygen. With less oxygen in the air, the peak temperatures created in the combustion chamber are reduced, and the levels of NOx are also reduced. **The lower the peak combustion temperature, the lower the production of NOx.**



Simple Reed-Valves Are Used To Control The Flow Of EGR

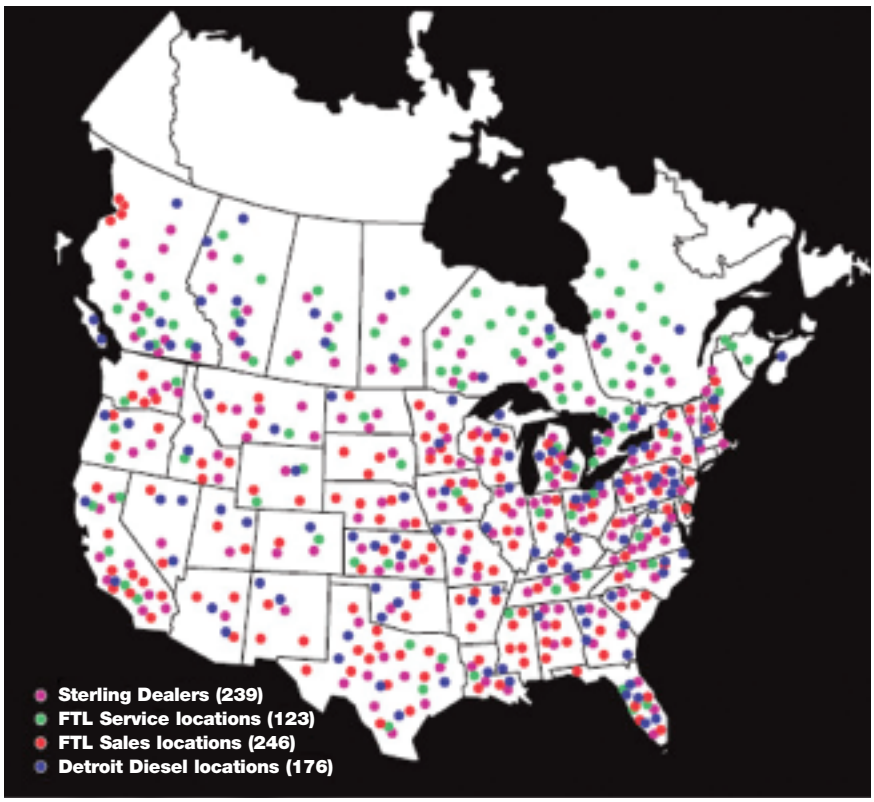
How A Reed-Valve Works

The Reed-Valve is a one-way “door” that allows exhaust gas to flow into the intake manifold but prevents air in the intake manifold from flowing back into the exhaust system. Pressure peaks in the exhaust manifold open the Reed-Valves.



And If You Do Need Service, There Are More Than 800 Service Locations In North America

- NAFTA-wide parts availability at all Detroit Diesel Distributor locations and Freightliner, Sterling and Western Star dealers.
- Immediate roadside assistance and technical support are just a telephone call away, 24/7.
  1-800-445-1980



All With Factory-Certified Technicians Who Know Your MBE 4000 Inside And Out

What's The Best Choice For Your Applications?

You Decide!

The MBE 4000

- Better Performance
- Better Fuel Economy
- Lighter In Weight
- Runs At Lower RPM
  - – Noise
  - – Fuel Economy
  - – Engine Life
- Better Braking Performance
- Lower Maintenance Costs
- Proven Durability
- Multiple Power Ratings
- Proven Electronic Controls
- Serviced At Hundreds More Locations

The Top Ten Reasons To Specify The MBE 4000 From Detroit Diesel In Your Next Freightliner, Western Star, Or Sterling Truck Or Tractor

- The entire Detroit Diesel Corporation (DDC) parts and service network supports the MBE 4000, including the 1-800-445-1980 24/7 Hotline, and the MBE 4000 is backed up by the entire Freightliner, Western Star and Sterling Dealer network.
- The MBE 4000 is certified to meet current emission standards.
- The MBE 4000 offers extended service intervals for the lube, fuel, and cooling system, reducing costs and downtime.
- The MBE 4000 offers outstanding performance at any speed for maximum on time productivity and driver satisfaction.
- The MBE 4000 produces maximum torque at low engine speed for excellent acceleration and reduced shifting.
- The MBE 4000 offers *best-in-class* engine braking. Over 500 *braking* horsepower is available for maximum safety, and reduced maintenance costs, especially in "tough-on-the-brakes" stop and go applications. In addition, this superior engine braking is achieved without the exhaust tone that is outlawed in some communities.
- The MBE 4000 offers easy to use electronic controls for engine and truck protection, self-diagnostics for ease in troubleshooting, and simple reporting that can help streamline fleet management.
- The MBE 4000 is equipped with 6 easy to replace electronically controlled unit injection pumps for excellent fuel economy and reduced downtime.
- The MBE 4000 requires less frequent scheduled maintenance than its competitors.
- A full two-year, unlimited mileage, 100% parts and labor warranty covers the MBE 4000. And, major components are covered for a full five years, 100% parts coverage. See your Dealer or Distributor for details.
- The MBE 4000 is manufactured by DaimlerChrysler, the world's largest maker of heavy duty diesel engines for on-highway use, designed specifically for the North American market, and backed up by the DDC, Freightliner, Sterling and Western Star organizations. You can run an MBE 4000 with confidence.
- The MBE 4000 weighs 2117 pounds, complete with engine brake, and offers increased payloads for bulk haulers and others with weight sensitive applications.
- Even though the projected life to overhaul for the MBE 4000 is longer than its competitors, the cost for parts and service is comparable.
- The MBE 4000 with Rear Engine Power Take-Off (REPTO) is ideal for a wide variety of vocational applications.
- The MBE 4000 offers the best combination of performance, fuel economy, cost of operation, reliability, driver satisfaction, ease of service, warranty satisfaction, and long life, all in a lightweight package.

DETROIT DIESEL

A DaimlerChrysler Company

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